



## Tides

### **What I Will Be Learning In This Mastery Badge:**

In this mastery badge we will learn how the Moon tugs on the Earth's oceans, creating tides.

### **What This Packet Includes:**

It is important that you complete all aspects of this packet so that you gain the knowledge and skills that we are working on.

#### **I. Discovering Lab**

A discovering lab is a fun, introductory lab, where we discover the knowledge on our own.

#### **II. Video Instruction**

You will watch a video presented by Mr. Bertoch, and answer questions about it.

#### **III. Literacy Practice**

Reading and writing are critical life skills, and also very important to science. You will read the assigned article and complete a writing prompt.

#### **IV. Applying Lab**

An applying lab is how you pass off the Mastery Badge. It serves as the quiz. It is a hands on demonstration that you have mastered the skills and content of this badge.

### **Key Things We Will Learn In This Mastery Badge**

Some of the most important things we will learn in this mastery badge:

- The Sun and the Moon have gravity.
- How does this gravity affect the Earth's oceans?
- What are tides?
- What causes tides?
- Why are there two high tides and two low tides each day?
- What is a spring tide?
- What is a neap tide?

Name: \_\_\_\_\_

Date: \_\_\_\_\_



# Discovering Lab

Learning Through Hands  
On Activities



## Activity: Discovering The Tides

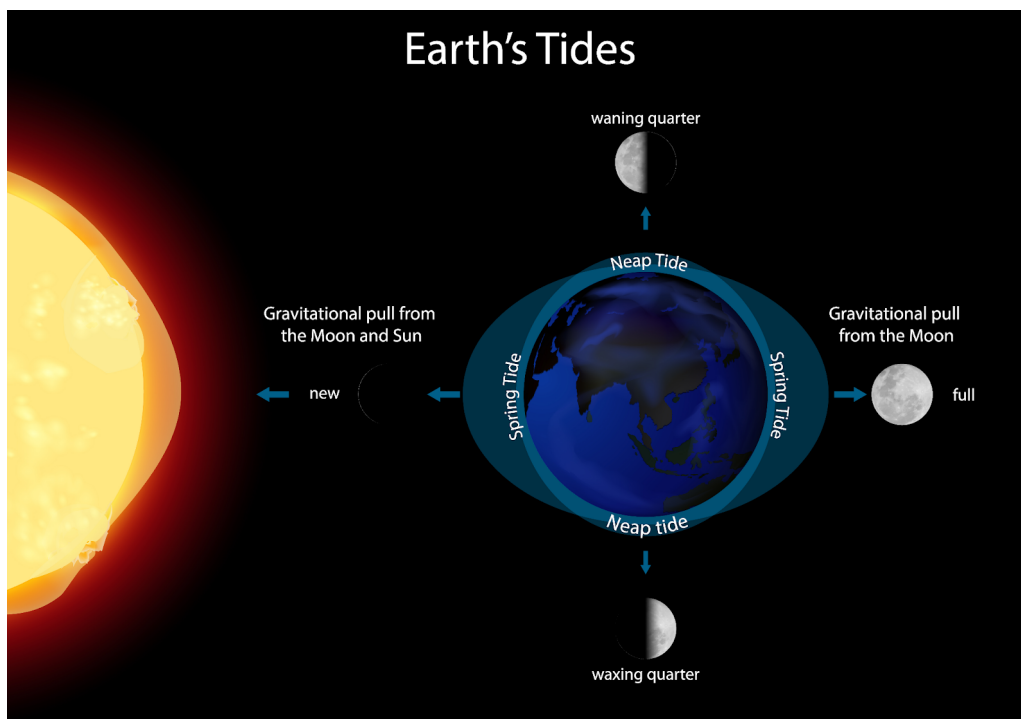
**Directions:** For the instructions below to learn about tides.

Video Instructions Available For This Assignment. Watch this video to learn how to do this assignment, and why it is important.



Scan This QR Code To Watch Mr. Bertoch Give You Directions For This Assignment

**Goal:** To learn as much as you can about tides.



### Collecting Data About The Tides

Scientists collect and analyze data in order to better understand the world around us. In this lab, you will be collecting and analyzing data about tides.

Select any beach anywhere in the world to study. Then find a tide table showing tide information for that area over the next few weeks. To find a tide table, you will have to search online.

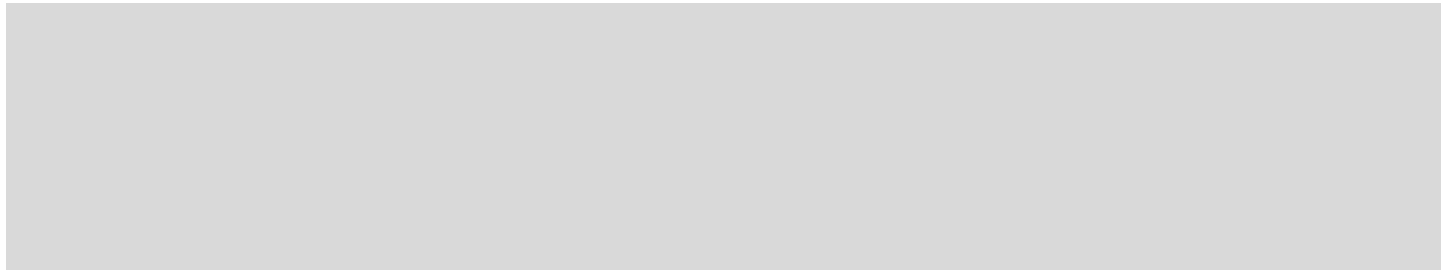
Complete the following chart by filling in the data from the beach or area you selected.

Date	High Tide Time	Height	Low Tide Time	Height	High Tide Time	Height	Low Tide Time	Height	Moon Phase

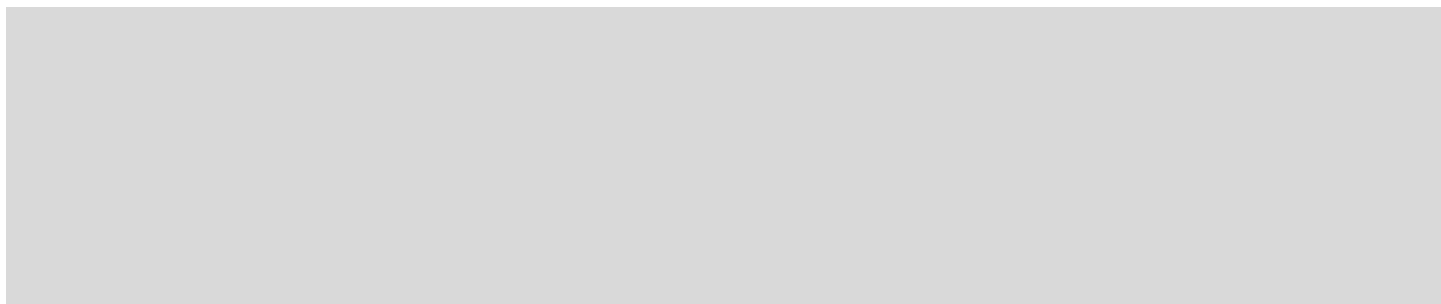
### Analyzing Data About The Tides

Now that you have collected your data, it is time to analyze it. There are no wrong answers. What matters is only that your conclusions match the data that you collected.

What patterns do you see in your data about when high tides occur?



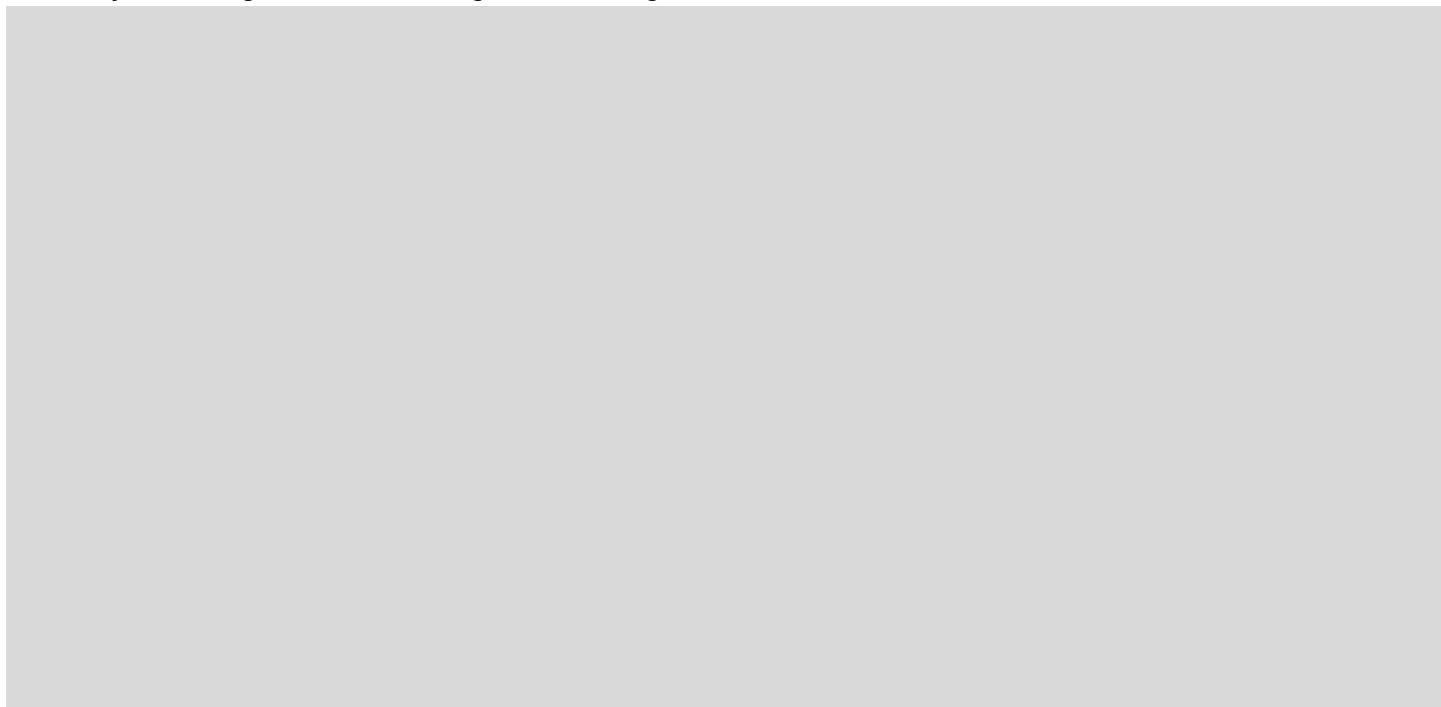
According to your data, are there any patterns between the tides and the phases of the moon? Explain your answer.



Based on your data, what conclusions can you draw about the possible causes of the tides? Remember, at this point, we are less concerned about getting the right answers and more concerned about being thoughtful and about using our own observations to draw conclusions. The theories that scientists formulate aren't always right on their first try and that is okay. What matters is that we are moving toward the correct answer.

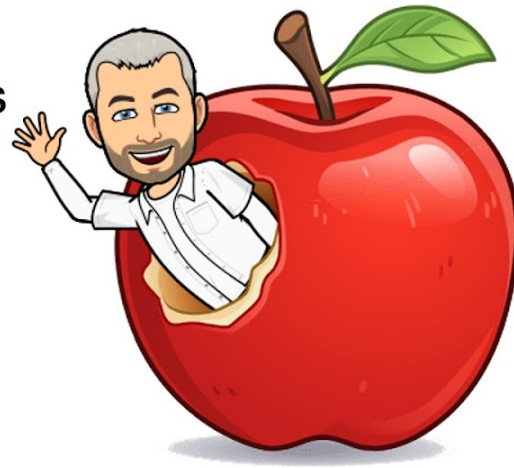
**What do you think?**

What is your best guess for what might be causing tides?



# Video Instruction

## Reviewing The Teacher's Instruction At My Own Pace



### Handsome Science Teacher One Take Videos

Now that you have completed the Discovering Lab let's watch the video that goes with it. In this video Mr. Bertoch will help connect the discoveries that you made during the lab to the broader concepts covered under this badge, and will also introduce the vocabulary that goes with these concept.

### Take Your Time, Pause And Rewind As needed

You are not in a hurry! It is more important that you understand the concepts in this video than that you finish it quickly. Take your time. If you don't understand something, pause the video and use the Internet or other resources to look up the concept that has you confused.

When you finish this video, you should have a good understanding of the concepts that have been taught. If you find yourself confused, rewind, and rewatch.

### The Video For This Mastery Badge Can Be Opened Using This QR Code

This Mastery Badge includes one video:



Watch The Assigned Science Video

Scan This QR Code To Open And Watch The Assigned Video For This Mastery Badge

### Check Point

Let's make sure that you really did take your time and watch the video carefully! Remember that it is important to hold yourself accountable to a high standard and to take pride in your own success as a learner.

**I watched the video carefully, and paused to look up anything I didn't understand.**

### Recording Your Learning

On the next page, you will record your learning and connect it to things you already know.

### Ten Things I Learned From This Video

A powerful tool to help you retain what you learn is to take notes. Notes give you something that you can look back at later, to quickly remind your brain reinforcing the memories for the concepts you have learned. Record ten things that you learned or that you perhaps already knew that were discussed in this video.

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.
- 10.

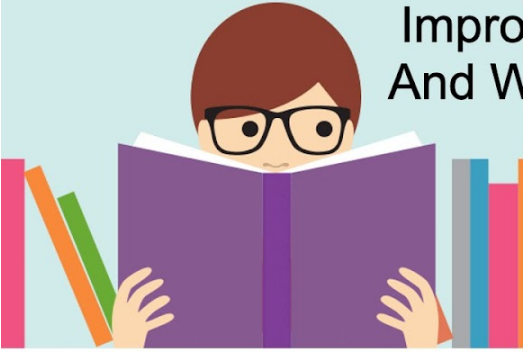
### Now, Let's Connect These New Concepts To Things You Already Knew

Another great way to help your brain retain new things is to connect these new concepts to other things that you already know. This gives your mind a place to store the new knowledge. Imagine that you are placing the new knowledge on a shelf in your brain next to facts that are already in there.

Write a paragraph explaining how the concepts taught in this video relate to things you already knew. There are no wrong answers. What are some things that you already knew that this video reminded you of?

# Literacy Practice

Improving Our Reading  
And Writing In Search of  
Knowledge



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## Activity: Reading And Writing About Lunar Phases

**Directions:** Reading and writing are very important life skills. Good scientists must be able to learn through reading and communicate their own discoveries through writing.



Video Instructions Available For This Assignment. Watch this video to learn how to do this assignment, and why it is important.

**Scan This QR Code To Watch Mr. Bertoch Give You Directions For This Assignment**

### 1. Practice Reading For Understanding

Read the article below **for understanding**. Reading for understanding means that you take your time and monitor your own learning. If you get to the end of a sentence and you do not remember or understand what you read, **re-read it**.

### 2. Practice Writing To Communicate

Complete the writing prompt below. Do your very best to write clearly so that others will understand what you are saying. This means using correct spelling, grammar, and writing, taking your time to think about the best ways to clearly communicate to others the main ideas that you are trying to get across to them.

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## Article:



Read The Assigned Article Carefully For Understanding.

<https://handsomescienceteacher.com/Online-science-classes-kids/what-causes-tides/>

**Scan This QR Code To Open And Read The Article That Goes With This Mastery Badge**

### Check Point

Let's make sure that you really did read for understanding! Remember that it is important to hold yourself accountable to a high standard and to take pride in your own success as a learner.

**I Read For Understanding. I did not skim the article. I understood the material that the article discussed.**

### Quiz Time

Complete the quiz at the end of the article and post your score in the box below. Your goal is to get at least 75% on the quiz. Did you accomplish this goal?

%

### Now Let's Write To Communicate

Remember that when you write to communicate you are taking your time, and explaining the topic in a detailed and concise way. Don't rush! You are not in a hurry. Think about what you are going to say, and plan how you will say it. So that someone else who reads your paragraphs will understand them easily.

**Writing Prompt:** Write two paragraphs in your own words explaining what causes the phases of the Moon.





Name: \_\_\_\_\_

Date: \_\_\_\_\_



# Applying Lab

## Proving That We Can Do It Ourselves



**Directions:** Complete each of the parts below. Record your observations in the space provided.



Video Instructions Available For This Assignment. Watch this video to learn how to do this assignment, and why it is important.

Scan This QR Code To Watch Mr. Bertoch Give You Directions For This Assignment

**Goal:** To create your own model of the phases of the moon

The Big Kahuna Surfing Challenge is coming to your community! (I hope you have beaches where you live, or it is going to be awkward!) The Mayor has assigned you a very important task. She needs you to schedule the dates of the surfing competition based on when the tide will be highest so that surfers can enjoy the best waves.

You must schedule this event far enough out so that all the competitors can book hotel rooms and plan their trips. At a minimum select a date six months from today when the tides will be at their peak.

**For this lab, you are not allowed to use an online tide table.**

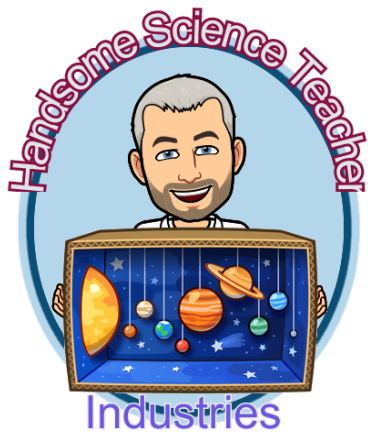
How will you forecast high and low tides without access to tide tables? How do the people who create the tide tables know when high tide is going to be?

Hint: It is okay to use a chart showing lunar phases to select your competition dates.

**Create a Competition Flyer**

Once you have selected the dates for your surfing event, create a flyer that could be posted around town. On this flyer explain that the event is being held during high tide. Discuss how you calculated the high tides for your community.

Note: If you live in an area where there are no beaches then you get extra credit for actually posting the flyers out around town, thus confusing local residents... okay, not really. Just pretend you have beaches.



**Congratulations! You Have Completed The Entire Mastery Badge**

You have worked really hard to earn this mastery badge. More importantly, you have worked hard to earn your knowledge!

**Time To Evaluate Your Work**

Check each of the following to evaluate your work:

1. Did you do every assignment?
2. Did you read the assigned article?
3. Did you watch the assigned video?
4. Did you answer all the questions using complete sentences?
5. Are your answers accurate?

**My Self-Evaluation:**

Based on the criteria listed above, I believe I have passed off this Mastery Badge because...  
(Be detailed and specific)

**Mastery Badge Counselor Evaluation:**

I have reviewed this student's work. Based on the criteria listed above I hereby certify that they have passed off the Mastery Badge because... (Be detailed and specific) Note: Any adult may serve as a Mastery Badge Counselor, so long as they are committed to ensuring the highest standards of excellence.

\_\_\_\_\_  
**Student's Signature**

\_\_\_\_\_  
**Date**

\_\_\_\_\_  
**Signature of Mastery  
Badge Counselor**

\_\_\_\_\_  
**Date**

## Certificate For Your Homeschool Records

The following certificate which has been awarded through self-evaluation by the student, and also certified by a mastery badge counselor proves that the student listed thereon has completed all the work and has mastered all the concepts for the specified topic.

**Keep this on file as evidence of your successful completion of this topic.**

If audited by the State, these certificates stand as evidence that you have worked on and successfully completed a rigorous science curriculum.



The certificate features a decorative border with a repeating floral pattern. In the top-left corner, there is a circular logo with a cartoon man's face and the text "Handsome Science Teacher Industries". The main title "Mastery Badge Certificate" is centered in a large, bold, black font. Below the title, the topic "Topic: Tides" is written in a purple font. A line for the student's name is preceded by "Student Name:". The central text reads: "This certificate certifies that the person named above has completed all of the requirements to earn this Mastery Badge." At the bottom, there are two horizontal lines for signatures and dates, labeled "MASTERY BADGE COUNSELOR SIGNATURE" and "DATE AWARDED". A small version of the logo is in the bottom-right corner.

Handsome Science Teacher Industries

# Mastery Badge Certificate

Topic: Tides

Student Name: \_\_\_\_\_

This certificate certifies that the person named above has completed all of the requirements to earn this Mastery Badge.

MASTERY BADGE COUNSELOR SIGNATURE \_\_\_\_\_ DATE AWARDED \_\_\_\_\_